

Book Reviews

DENTAL ANTHROPOLOGY. By Simon Hillson.
New York: Cambridge University Press.
1996. 373 pp. ISBN 0-521-45194-9. \$74.95
(cloth).

Simon Hillson has done it again! Ten years before the appearance of the present volume he produced an excellent book with the simple title of *Teeth* (Hillson, 1986). Now he has written an updated, companion book, *Dental Anthropology*. It may seem presumptuous to use this all-encompassing title that was used over thirty years ago in what was arguably the first dental anthropology book to enjoy widespread use (Brothwell, 1963) and what may even have defined dental anthropology, but Hillson has furnished us with a book that builds on, and in many aspects improves on, the Brothwell-edited volume. According to Hillson, "Dental anthropology . . . can be defined as a study of people (and their close relatives) from the evidence provided by teeth." (p. 1) This definition is, I believe, unduly restrictive and Hillson proves my point in his sweepingly comprehensive vision of dental anthropology. This is not a compendium of papers as was the first *Dental Anthropology* volume but a cohesive, well-designed look at the field, indicating the vast amount of research and thought that went into its writing.

Hillson has included over 900 references that encompass all of the more important papers in the field. These will be of tremendous use to the researcher who has not accumulated a large personal database. The References section alone is practically worth the price of the paperback edition since it will assist the student who needs a beginning point for studying or writing on a dental anthropological subject. As Hillson himself notes, "This book . . . attempt[s] to provide an introduction to the main skills required, the major issues raised, with a pathway to the literature so that readers can follow up these arguments themselves.

The bibliography is therefore one of the largest sections." (p. 5)

The book's chapters on dental anatomy, variation in size and shape of teeth, occlusion and the timing and sequence of dental growth precede those treating in some detail enamel, dentin and cementum primarily from a histological view. A chapter on the biochemistry of the teeth summarizes recent developments in this area. Two of the more valuable chapters summarize histological methods of age determination and tooth wear and modification. As might be expected, there is a chapter on dental diseases. The appendices will be of value to those who need practical information for "doing" dental anthropology. Techniques for the excavation of skeletal materials, dissection of jaws, sectioning, measuring, etc., can be found here along with a valuable discussion of microscopy.

The deficiencies of the volume are limited to the quality of printing and to some "misplaced" explanations of the figures and tables. Table 5.1 (on p. 123), providing a valuable overview of tooth formation timing, is left to stand alone with no explanation of the terms used. Only six pages later do we learn what the various abbreviations are, and it takes another three pages before there is reference to it in the text. Later, Figure 5.8 provides a poor reproduction of Schour and Massler's dental development diagram. There is no excuse for such poor reproduction since, as in *Teeth*, this chart has been reproduced numerous times with excellent clarity. There are other examples of reproduced charts and illustrations which reveal that the publisher has not taken the care in reproducing them that one should expect.

As with any book, a single reviewer will find points of disagreement on the content and emphasis. I would have preferred expanded sections on variation in dental morphology and tooth abrasion, and a more detailed emphasis on tooth size. Similarly, there could be less emphasis on the histology of the dental tissues, subjects that may

be more adequately covered in dental histology and some dental anatomy texts. However, Hillson has given the histological sections an anthropological view seldom found in strictly dental texts. *Teeth* offered a better discussion of the variability of tooth morphology but the present volume gives a much better basic description of human dental morphology, providing a very good, succinct description of each tooth that will allow its identification.

Who is the appropriate audience for this book? Hillson claims that the book is written mainly for biological anthropologists, acknowledging their diverse interests in forensic odontology, dental morphology, demography, archeology, paleontology and primatology. Had the book attempted to cover all these topics in detail it would be extraordinarily fat, so Hillson has limited its scope primarily to *Homo sapiens*. (*Teeth* provided valuable dental data on large numbers of Orders and Families that assisted with their identification.) This is a book best suited for a graduate or an upper-level undergraduate dental anthropology course or for use as a basic reference text for a dental anatomy course. (I have used *Teeth* for several years as a reference for dental students, especially since it has been available in soft cover. I will do the same for the soft-cover edition of this book.)

A comparison of Hillson's new volume with his earlier one reveals no clear winner.

Each has its particular strengths and I am in a quandary over which to recommend. The more recent is not a revision of the older one; rather, it is a new volume expanding on its treatment of many topics found in the earlier one, but also not repeating much that made the first so valuable. The solution is simple: a boxed set of both volumes! In concluding this volume, Hillson writes that, "... [teeth] are really very stylish sculptures that are seen to best advantage in fossilized material, or when coated with gold for electron microscopy. Others may be put off by their small size and sheer complexity, but this is precisely how so much useful information is concentrated in them." (p. 294) His latest volume is also this: very stylish, concise, complex and packed with information. He is to be congratulated on producing two volumes invaluable to the study of dental anthropology. *Dental Anthropology* is essential for any dental anthropology library.

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YELLOW FEVER, BLACK GODDESS: THE COEVOLUTION OF PEOPLE AND PLAGUES. By Christopher Wills. New York: Addison Wesley. 1996. 324 pp. ISBN 0-201-44235-3. \$24.00 (cloth).

Like many infectious diseases themselves, books about epidemic disease appear to go through cycles of popularity. We are now in the midst of another such cycle—the last five years have seen the publication of numerous books about the ecology and evolution of infectious diseases: scholarly treatises, such as Ewald's *Evolution of Infectious Disease*;

semi-scholarly accounts directed at scientifically sophisticated laymen, such as Garrett's *The Coming Plague*; and books written for a general audience, such as Preston's *The Hot Zone*. *Yellow Fever, Black Goddess: The Coevolution of People and Plagues* falls into the middle category. Using language that intelligent laymen can understand, Wills weaves a fascinating tale of how pathogens and their hosts interact with one another and with their environment.

Although the title of the book refers to only two diseases, yellow fever and cholera, the book is not just about the history of these

two diseases. Rather, its goal is to explain in ecological and evolutionary terms why and how disturbances of the ecological balance of the world's environments can lead to new epidemics of known infectious diseases as well as the evolution of new plagues.

The book is divided into five parts. Part One sets the biological stage for later detailed discussions of particular diseases. Brief discussions of recent outbreaks of several diseases, including cholera, bubonic plague, and hantavirus, are used to illustrate ecological, evolutionary, and immunological concepts. In addition, the book includes a brief overview of the work of John Graunt and the dawning of modern demographic studies of the causes of mortality.

Parts Two through Four focus on particular diseases (bubonic plague, cholera, typhoid, malaria, and syphilis) that have had a major impact throughout the history of human civilizations and continue to cause problems in modern times. Each of these parts has a particular theme which is subtly suggested by the title of the section. For example, malaria and syphilis are the focus of Part Four, "The Challenge of the Temperate Zones." Most readers are aware that syphilis is a disease of all environments and may not understand why it would be discussed in a section ostensibly centered on temperate zones, and the connection is even less obvious for malaria, which is firmly entrenched as a tropical disease in the minds of most people. However, the connections of these two diseases to temperate environments illustrates effectively how evolution and ecology of both host and pathogen interact to determine the nature of the infectious disease experience of the host. Syphilis is a sexually-transmitted disease with close (and sometimes visually indistinguishable) relatives that cause common tropical diseases (yaws, pinta, and bejel). Yet syphilis itself is found worldwide. Wills uses this fact to discuss what a tropical microorganism might need to do in order to survive in a temperate environment. In the case of syphilis, the adaptation involved colonization of the genital tract in a highly mobile and sexually active large population, which guaranteed an internal, tropics-like environment and enough hosts to maintain transmission. Ma-

laria, which is now common only in the tropics, was once widespread in temperate regions as well. Wills nicely weaves together a discussion of the ecology of the malaria-prone areas of both the present and past with human behaviors in an attempt to explain why the distribution of the disease has changed.

Part Five of the book concentrates on the present and the future and considers in some detail both "new" plagues, particularly AIDS, and the interesting question of why there is so much diversity in both pathogens and other organisms, especially in the tropical regions of the world. Wills argues that diseases have an important role to play in generating diversity in other organisms, and that in turn, the diversity in these organisms leads to the continual evolution of new strains and species of pathogens.

One of the most entertaining aspects of this book is the effective use of both quotes and literary allusions. Nearly every chapter begins with a quote that relates in some way to the content of that chapter. For example, the quote at the beginning of the chapter on cholera comes from a 19th century history of the disease and mentions a cholera goddess prevalent in India. This is the first hint the reader gets that the "Black Goddess" in the title refers to cholera—a point that is further elaborated in the first paragraph. Literary allusions are abundant. One particularly entertaining allusion to look out for is Wills' comparison of microorganisms and Uriah Heep. A second, more subtle and extensive allusion, encompasses the entire fourth chapter, which is entitled "Four tales from the New Decameron." The chapter begins with a quote from Boccaccio's *Decameron* that knowledgeable readers readily recognize as referring to bubonic plague in Italy. Yet, rather than discussing the history of plague at the beginning of the chapter, Wills immediately shifts to a brief discussion of a modern epidemic in Arctic muskoxen that was traced to a relative of the human plague bacillus. In Boccaccio's book, ten people fleeing from an epidemic of plague have taken refuge in a Florentine villa and entertain themselves with stories—100 in all. Wills, in his "New Decameron" also tells a series of stories, but he tells only

four and they are about plague itself. His "storytellers" are the leading players in the natural history of plague—the bacillus, the human host, the rat, and the flea.

While the literary allusions and the style of writing make *Yellow Fever, Black Goddess* an entertaining book to read, it conveys important concepts about the evolution and ecology of infectious diseases. The book provides a readable introduction to parasite ecology and evolution. Although the biological principles are not always explicit, Wills provides enough detail so that readers with a background in ecology will be able to jump from general principles to understanding parasite ecology, while readers with little background will understand the main points without being overwhelmed by technical details. This book would be ideal for discussions in undergraduate courses focusing on ecological principles or infectious diseases in human populations. Human biologists interested in ecology and evolution in general and those wanting a book outside their area to help get creative juices flowing will also enjoy this book.

Although this is an interesting and enjoyable book, it is intended for a knowledgeable popular audience, not for specialists. A glossary is included to define and clarify the most important terms and basic principles. The references are presented in a series of notes to accompany each chapter, and in

keeping with the tenor of the book, they are a combination of selective, scholarly reviews and popular books and articles. As in most semi-scholarly works, they are intended to guide the reader to further materials on the subject, and are not an exhaustive citation of the literature perused by the author. A full bibliography of sources is not included; thus, the book will provide specialists with tantalizing ideas, but to include them in their own scholarship they would need to repeat Wills' research.

On the whole, though, Wills succeeds nicely in telling the story of how ecological and evolutionary factors influence interactions between and diversity of both hosts and parasites. After all, "diseases form an important part of the story of life on our planet—and, frightful though many of them are, the world would be a far less rich place without them (p. 273)."

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